Title: Production, purification and characterisation of polysaccharides from Pleurotus ostreatus with antitumour activity

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Abstract: BACKGROUND: Mushroom polysaccharides play an important role in functional foods because they exhibit biological modulator properties such as antitumour, antiviral and antibacterial activities. The present study involved the production, purification and characterisation of intracellular and extracellular free and protein-bound polysaccharides from Pleurotus ostreatus and the investigation of their growth-inhibitory effect on human carcinoma cell lines. RESULTS: Several fermentation parameters were obtained: batch polysaccharide productivities of 0.013 +/- 8.12 x 10(-5) and 0.037 +/- 0.0005 g L-1 day-1 for intracellular and extracellular polysaccharides respectively, a maximum biomass concentration of 9.35 +/- 0.18 g L-1, Pmax = 0.935 +/- 0.018 g L-1 day-1, mu max = 0.218 +/- 0.02 day-1, YEP/X = 0.040 +/- 0.0015 g g-1 and YIP/X = 0.014 +/- 0.0003 g g-1. Some polysaccharides exhibited superoxide dismutase (SOD)-like activity of 50-200 units. Fourier transform infrared analysis of the polysaccharides revealed absorption bands characteristic of such biological macromolecules. Cytotoxicity assays showed that both intracellular and extracellular polysaccharides exhibited antitumour activity towards several tested human carcinoma cell lines in a dose-dependent manner. CONCLUSION: The polysaccharides of P. ostreatus exhibited high SOD-like activity, which strongly supports their biological effect on tumour cell lines. The extracellular polysaccharides presented the highest antitumour activity towards the RL95 carcinoma cell line and should be further investigated as an antitumour agent. Copyright (C) 2012 Society of Chemical Industry

Author Keywords: Polysaccharides; Pleurotus Ostreatus; Submerged Fermentation; HPLC; FTIR; Gel Filtration Chromatography; SOD-Like Activity; In Vitro Antitumour Activity

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